

General Descriptions of Remedial Methods Used at Leaking Underground Storage Tank Sites

Typically more than one of the remedial technologies described below are utilized to achieve clean up standards in soil and groundwater. For example, although natural attenuation can sometimes be relied on as the sole method of achieving cleanup, it may take many years for the cleanup standards to be met in soil and groundwater. However, it is often proposed as a final stage in the cleanup process once contaminant levels have reached a low enough level to terminate active remedial methods such as soil vapor extraction and air sparging. Once contaminant levels decrease to below cleanup standards, the site may be eligible for closure.

Active remediation is typically focused on the cleanup of contaminants in soil and groundwater on the site where the release occurred (source area). When the source area that “feeds” contamination in groundwater has been cleaned up as much as possible by utilizing active methods, natural attenuation may be more effective as a cleanup method to address the remaining contamination in groundwater. However, the most effective remedial approach must be reviewed for each site.

Natural Attenuation:

In the natural attenuation process, existing bacteria at the site consume contaminants as their food source. Periodic monitoring of contaminant levels is required by ADEQ.

Soil Vapor Extraction:

During soil vapor extraction (SVE), vapors are extracted from the contaminated area and treated, if required by applicable law. To evaluate the effectiveness of SVE, periodic monitoring of contaminant levels is required by ADEQ.

Air Sparging System:

During air sparging, air is injected into contaminated groundwater to volatilize the contaminants, which are recovered and treated at the surface, if required by applicable law. To evaluate the effectiveness of air sparging, periodic monitoring of contaminant levels is required by ADEQ. Typically, SVE is utilized in conjunction with air sparging to collect and treat the contaminants that are volatilized from groundwater and remediate contaminated soil at the same time.

Pump and Treat:

During pump and treat, a periodic monitoring of contaminant levels will be required by ADEQ. Although this used to be utilized more often as a remedial technology, it is not commonly used now because it is generally too costly in comparison with other technologies that are just as effective.

Bioremediation:

During active bioremediation, the existing or added bacteria use contaminants as their food source, eventually eliminating contaminants from the site. Additional chemicals are sometimes added to soil and groundwater to aid the bacteria in metabolizing the contaminants. To evaluate the effectiveness of active bioremediation, periodic monitoring of contaminant levels will be required by ADEQ.

Multi-Phase Extraction

During Multi-Phase Extraction (MPE), both groundwater and free phase hydrocarbons such as gasoline or diesel fuel (free product) and vapor phase hydrocarbons are removed in a manner that typically minimizes the amount of groundwater that must be disposed of. Vapors are treated at the surface, and free product is typically hauled off for disposal/recycling.

Excavation

If no barriers exist above the contaminated soil (e.g. buildings), and contaminants do not extend to a great depth, excavation of contaminated soil is often utilized to help remove hydrocarbons retained in soil in the “source area” in the vicinity of the release or leak.

More detailed information regarding cleanup methods can be found on the U.S. Environmental Protection Agency’s website at <http://www.epa.gov/oust/cat/remedial.htm>